SOME OF THE ULTIMATE PHYSICAL EFFECTS OF PREMATURE TOIL

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It is greatly to be regretted that it is as yet not possible to present to this committee a comprehensive report upon the physical effects of premature toil, based upon a thorough and scientific investigation. Many persons express surprise at learning that up to this time no such study has been made. In the course of a recent effort to improve the child labor law of this state, a discussion developed between the committee and a group of manufacturers objecting to certain of its provisions, the committee seeking to show that ten hours of work daily must be considered injurious to the organism of boys between the ages of fourteen and sixteen, even though the employment involved no great muscular exertion. We were met with the request to furnish reliable evidence that this is the case; evidence which we were unable to produce, even though we were perfectly sure in our own minds of the truth of our statement. It is apparent that the value of such evidence would be exceedingly great in the efforts to secure for the growing child its natural rights; of which efforts this meeting is so vigorous an expression.

Unless one has devoted some thought to the subject, it might appear to be a task of no great difficulty or magnitude to collect the data incident to such an investigation. However, the reverse is true, as may be seen from the following requirements, which are none too severe if reliable information is to be obtained.

It should be required:

(*a*) That the investigation comprehend a large number of children in each of the groups to be mentioned.

(*b*) That the measurements be made by those familiar with such work, in order that they may be trustworthy; and by persons competent to detect physical abnormities even in their beginnings.

(*c*) That a sufficient number of measurements be taken of each child so as to insure a convincing record of its physical condition.

(*d*) That the children be examined upon beginning their factory life and at certain intervals until the termination of adolescence.

(*e*) That comparative investigation be made of a large number of children of the same types who have not been engaged in gainful occupations during the most active period of adolescence.

The value of such an investigation may well be considered inestimable. It would determine beyond doubt whether the charge of physical deterioration from premature toil is a just one or not and would fix definitely the responsibility of the state in the protection of its future citizens and mothers. We feel sufficiently sure of the result of such an investigation, made with skill and impartiality, as to court it most ardently. Upon thoughtful consideration it must, however, appear that the means and power necessary for the execution of so comprehensive a program cannot be within the reach of a private association. This should be a function of government, and the need for it might well be looked upon as one of the most important arguments for the establishment of a Children's Bureau at Washington.

In the absence of data dealing with the investigation of large numbers of toiling children and based upon a systematic plan of observation and record, it may nevertheless be of interest to call attention to certain effects of a purely physical character which professional experience has for years been accustomed to look upon as the results of environment and occupation, and especially when considered with reference to the physical peculiarities of the child between the ages of ten and sixteen years. In doing this, effort will be made to avoid that which is purely technical, but also that which is in any way still a matter of supposition rather than observation, and therefore not generally accepted.

The rôle of the play hours in the development of the young child, his innate desire for physical activity and especially in the open, are well recognized by all laymen, and there are few indeed who will not acknowledge how important these are in promoting the formative processes which are at this time of life actively going on. The statement that this natural desire for movement and exercise cannot be balked in the child eight to ten years of age, without

damage to his physical progress, will meet with little protest, and for the present discussion this is of minor importance, since, by far the greater number of children at work have at least passed their tenth year, and since no state, whose statutes do not ignore the question altogether, has ventured to place the limit for work below this. When the child arrives at its twelfth year, however, it enters a period which, lasting until its seventeenth year as a rule, is characterized not only by those changes of disposition, of mind and soul, of body and appearance, embraced by the term "puberty," but a period also during which the body experiences its most rapid growth in length. As the bones grow longer, at this rapid rate, the muscles controlling these bones must grow longer with them. The muscles must, however, increase not only in length but in volume if their strength is to be proportionate to the ever-increasing demands made upon them. That this increase of volume, therefore, of strength, is dependent upon exercise, is common knowledge; that lack of use causes wasting and therefore weakening of muscle is no less so. It is likewise well known that excessive exercise of certain muscles will result not in increase of strength but in degeneration and weakening, and that there is no surer way of inducing great fatigue than by using the same set of muscles for a long time without change, thus giving no opportunity for what is called rest but what is really the replenishing of muscle material which has been consumed. Let us now apply these statements in practice; to the case of a girl feeding material to a machine and sitting in one position for hours at a time; to the case of a boy handling small articles of manufacture, having perhaps nothing more to do than to remove them from one machine to another close by, or to perform, in the standing position, a set of movements with rapidity but involving no test of strength whatever. Such work commonly develops quickness of eye and dexterity of fingers. It is certainly not looked upon as involving physical strain of any account. Here lies the fallacy; standing and sitting are looked upon as passive and involving no great muscular action. If this were true, why should we then tire so much more easily from standing than from walking, since this apparently requires much more use of the muscles; why so much more easily from holding a weight continuously in one position than from moving it in various directions.

As a matter of fact, standing and sitting are possible only by

active muscular work, and, when prolonged, have connected with them the disadvantage of permitting but little change of activity to other muscles. It cannot be surprising to learn, therefore, that under these circumstances the tissues yield under unrelieved strain; that the leg and trunk muscles become excessively fatigued and thus compel the assumption, for relief, of faulty postures and attitudes which can at first be voluntarily departed from, but which finally take the place of the normal and leave the child more or less permanently deformed. Thus it is that, even before the advent of modern factory employment, certain deformities were recognized as being associated with certain occupations; the expression "baker's legs," for example, will be found in surgical treatises written many years ago. The argument that the labor performed by the child is not hard is therefore only a specious one. Keeping a growing individual at an occupation, for ten hours daily, which involves the use of only a limited set of muscles, when he is at an age when nature prompts running and jumping, deprives him of the need for deep breathing, and therefore expansion of the chest, which these bring with them, and of the stimulus to the blood circulation which, although often harmful to the man past middle age, is of the greatest value to the developing organism.

However desirable it may be to preserve the normal form and symmetry of the human body, that it may be agreeable to look upon, there is underlying this a factor of greater import to humanity than mere personal vanity. This is the economic factor which takes into account the future of the individual, after the period of immaturity has passed and the child has become the citizen and has assumed the responsibilities of parentage. Whatever can be shown to now permanently impair wage-earning capacity or to interfere with the performance of family duties, or indeed to shorten the tenure of life, will be acknowledged by all to be of prime importance. I shall not refer to such conditions as general weakness or diminished chest capacity and the tendency to acquire disease in consequence thereof, but rather to certain definite deformities which I have had frequent opportunity for observing, both in process of formation and in their final results.

For the present, the various occupations of toiling children may be grouped according as the work is done in standing or

sitting position. In general, and there are of course many exceptions, boy's work requires standing and girl's work sitting. It may also be said, in the same general way, that the work which the boy does standing is an apprenticeship for work which the man also does, as a journeyman, in the standing position. This is correspondingly true of girl's work. Standing occupations naturally involve the feet and legs in greatest strain, and more especially the feet. In consequence we see developing, during the adolescent years, that condition known as weak and flat foot. This frequently occurs in the adult also from causes of similar nature, but only too frequently the result of conditions and weakening which must be attributed to the period of active growth. The deformity acquired in adult years, though it may be disabling and painful in high degree, but rarely assumes the severe form so frequently seen in the later period of adolescence as a sad testimony of the child's experience. Commonly, the foot loses its strength and shape gradually, so that, at this time, but little notice is taken of it. Later, when the child has become the father, and the necessity for continuous employment is apparent, the feet only too frequently become so painful that long abstention from work is imperative, and it happens not rarely that an entire change of employment cannot be avoided; thus are lost the skill and aptitude acquired during the period of prematurity; for while medical science can do much for these unfortunates, they are often debarred from continuing in trades requiring constant standing. Frequently upon coming under medical care the condition is such that nothing short of a long stay in hospital will prove availing, and this means loss of income if not loss of independence for a greater or less period. I doubt whether it is generally realized how frequently such conditions are met as those to which I have just referred. While originally uttered in a somewhat different sense, the saying seems here most appropriate that "the boy without play is the father without a job." When the one weekly holiday comes, the accumulated fatigue of the week's standing is apt to be so great that only the exceptionally robust have the desire for outdoor exercise left in them. The day is therefore only too often used for repose of the body, which, while furnishing relief to the excessively fatigued muscles, does nothing for the remainder of the organism, which would otherwise invite active movement in the open air.

Turning now to the girl in the sitting occupation, I would attract your attention to the frequent occurrence of curvature of the spine, spoken of as "lateral curvature." This deformity is often seen in school children and even in those leading luxurious lives. It betokens a weakness of fiber and a need for physical culture, which is, however, to be controlled by proper treatment. When this is within reach, the progress of the deformity is checked so that it does not become a menace to health, and it is objectionable chiefly as constituting an esthetic defect which the skilful dressmaker is usually able to conceal.

Were this, however, the extent of the damage done to the organism by lateral curvature, I should have nothing to say of it in this place. It becomes of importance in this connection, however, because it is so frequently seen in girls who have been engaged in sitting occupations during the developmental period and because in them it assumes not only the rôle of a deformity of most severe type, not simply a most unfortunate disfigurement, but also because it now constitutes a very serious menace to health and the attainment of longevity of even average degree. I shall not discuss the deformity in detail except to say that when assuming the severe grades under discussion, its effects reach far beyond the spine itself, which bends not simply to one side or the other, but is always markedly twisted on its vertical axis also. In this twist the chest participates fully, so that not only is its power of expansion greatly interfered with, but its capacity is reduced and much crowding and displacement of the vital organs contained within can be determined. Small wonder, then, that such severe degree of lateral curvature adds greatly to the likelihood of developing pulmonary consumption and that the heart cannot be thus pushed aside with impunity. It has been ascertained that, for these reasons, the duration of life of individuals with severe lateral curvature is far below the average. The remoter effect of the deformity upon the pelvis of the girl I need only mention to the extent of saying that here, too, a distortion and diminution of normal capacity frequently results, so that this has always been recognized by medical men as of potentially serious influence upon the maternal function.

In conclusion it is to be said that these deformities are by no means confined exclusively to the one sex or the other; neither is

it to be interpreted that they occur in every child who works, or even in the greater number. It is asserted, however, that these deformities in the severe forms before referred to are particularly frequent among toiling children, or those who have toiled as children. That the unfavorable influences of premature toil are only too often augmented by unfortunate home influences, by dwellings that are unfit, by insufficient and improper food, does not alter the case. I have aimed to speak of these deformities in particular, because of their serious nature and because I have had abundant opportunity for observing them. On the other hand, it is not to be overlooked that these are by no means the only, or even the most common, evidences of physical deterioration to be observed among working children.